

CLAIMS

1. A cell comprising:
an acidic medium;
a first electrode which is disposed in the acidic medium;
a basic medium which is kept in contact with the acidic medium; and
a second electrode which is disposed in the basic medium,
wherein the acidic medium contains a first substance which causes a reaction of removing electrons from the first electrode, accompanied by hydrogen ions contained therein, and the basic medium contains a second substance which causes a reaction of donating electrons to the second electrode, accompanied by hydroxide ions contained therein.
2. The cell of claim 1, wherein the first and second substances are the same.
3. The cell of claim 2, wherein both of the first substance and the second substance are hydrogen peroxide.
4. The cell of claim 3, wherein hydrogen peroxide is supplied as a liquid or a solid, which contains hydrogen peroxide or which releases hydrogen peroxide due to a chemical change.
5. The cell of claim 1, wherein the acidic medium is formed by an acidic aqueous solution and the basic medium is formed by a basic aqueous solution.
6. The cell of claim 5, wherein the acidic aqueous solution and the basic aqueous solution have a channel structure forming laminar flows therein.
7. The cell of claim 5, wherein the acidic aqueous solution comprises one or more acid

substances selected from the group consisting of sulfuric acid, methane sulfonic acid, trifluoromethane sulfonic acid, hydrochloric acid, hydriodic acid, hydrobromic acid, perchloric acid, periodic acid, orthophosphoric acid, polyphosphoric acid, nitric acid, tetrafluoroboric acid, hexafluorosilicic acid, hexafluorophosphoric acid, hexafluoroarsenic acid, hexachloroplatinic acid, acetic acid, trifluoro acetic acid, citric acid, oxalic acid, salicylic acid, tartaric acid, maleic acid, malonic acid, phthalic acid, fumaric acid, and picric acid.

8. The cell of claim 5, wherein the basic aqueous solution comprises one or more bases selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide, calcium hydroxide, barium hydroxide, magnesium hydroxide, ammonium hydroxide, tetramethylammonium hydroxide, tetraethylammonium hydroxide, tetrapropylammonium hydroxide, and tetrabutylammonium hydroxide, or one or more alkali metal salts of weak acid selected from the group consisting of sodium carbonate, sodium hydrogencarbonate, potassium carbonate, potassium hydrogencarbonate, sodium borate, potassium borate, sodium silicate, potassium silicate, sodium tripolyphosphate, potassium tripolyphosphate, sodium aluminate, and potassium aluminate.

9. The cell of claim 1, wherein the acidic medium is constituted by an acidic ion-exchange member, and the basic medium is constituted by a basic ion-exchange member.

10. The cell of claim 9, wherein the ion-exchange member is selected from the group consisting of polyvinylstyrene ion-exchange resin, polyfluorohydrocarbon polymer electrolyte membrane, polyvinylstyrene ion-exchange membrane, and fibrous polystyrene

ion-exchange filter paper.

11. The cell of claim 1, wherein the acidic medium is constituted by an acidic ion-conductive gel, and the basic medium is constituted by a basic ion-conductive gel.
12. The cell of claim 11, wherein the acidic ion-conductive gel is formed by gelling an acidic aqueous solution with water glass, silicon dioxide anhydride, cross-linked polyacrylic acid, or a salt thereof.
13. The cell of claim 11, wherein the basic ion-conductive gel is formed by gelling a basic aqueous solution with carboxymethyl cellulose, cross-linked polyacrylic acid, or a salt thereof.
14. The cell of claim 1, wherein the first electrode comprises one or more materials selected from the group consisting of platinum, platinum black, platinum-oxide-coated platinum, silver, gold, surface-passivated titanium, surface-passivated stainless steel, surface-passivated nickel, surface-passivated aluminum, a carbon structure, amorphous carbon, and glassy carbon.
15. The cell of claim 1, wherein the second electrode comprises one or more materials selected from the group consisting of platinum, platinum black, platinum-oxide-coated platinum, silver, gold, surface-passivated titanium, surface-passivated stainless steel, surface-passivated nickel, surface-passivated aluminum, a carbon structure, amorphous carbon, and glassy carbon.
16. The cell of claim 1, wherein the first electrode and the second electrode are plate-shaped, thin-film-shaped, mesh-shaped, or fibrous.
17. The cell of claim 1, wherein the first electrode and the second electrode are

respectively formed to the acidic medium and the basic medium by using a nonelectrolytic plating method, a vapor deposition method, or a sputtering method.

18. A method of power generation by using a cell comprising:

an acidic medium;

a first electrode which is disposed in the acidic medium;

a basic medium which is kept in contact with the acidic medium; and

a second electrode which is disposed in the basic medium,

wherein a first substance which is contained in the acidic medium causes a reaction of removing electrons from the first electrode, accompanied by hydrogen ions contained therein, and a second substance which is contained in the basic medium causes a reaction of donating electrons to the second electrode, accompanied by hydroxide ions contained therein, so that power is generated.